

# PERFORMANCE OF W-BEAM GUARDRAIL AFTER HEIGHT ADJUSTMENT

## BACKGROUND

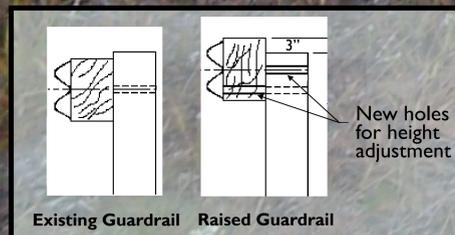
ADDITIONAL PAVEMENT THICKNESS THAT RESULTS FROM RESURFACING REDUCES THE HEIGHT OF THE GUARDRAIL RELATIVE TO THE PAVEMENT SURFACE. RAISING THE WOODEN OFFSET BLOCKS THREE INCHES, WHILE LEAVING THE POSTS AS THEY WERE INITIALLY INSTALLED, IS A KNOWN LABOR AND COST SAVING TECHNIQUE. THIS STUDY WAS PERFORMED TO DETERMINE THE SAFETY OF THIS PROCEDURE, AND TO CONFIRM THAT THE TECHNIQUE IS ACCEPTABLE TO FEDERAL HIGHWAY ADMINISTRATION STANDARDS.

## AREAS INCLUDED IN THE STUDY

GENERAL LOCATION	ROUTE	APPROXIMATE LOCATION	MILE MARKER
CONCORD	I-93	EXIT 15 - 17 NB & SB	39.4 - 43.4
NORTHFIELD	I-93	EXIT 20 - 22 NB/SB	59.4 - 68.8
NEW HAMPTON	I-93	EXIT 23 - 24 NB/SB	69.0 - 74.8
GRANTHAM-ENFIELD	I-89	EXIT 14 - 16 NB/SB	49.0 - 57.6
EPPING-EXETER	101	EXIT 7 - EXIT 9 EB/WB	119.2 - 124.2
SALEM-ATKINSON	111	ERMER/HALL FAME RD	22.0 - 23.6

## PROCEDURE USED TO RAISE GUARDRAIL

- ◆ REMOVE EXISTING BLOCK FROM THE POST
- ◆ DRILL A SECOND HOLE IN THE POST 3-INCHES ABOVE EXISTING HOLE
- ◆ DRILL A SECOND HOLE IN THE BLOCK 3-INCHES BELOW EXISTING HOLE
- ◆ REATTACH BLOCK TO POST RE-USING EXISTING BOLT & NUT (IF USABLE) AND ONE NEW BOLT & NUT
- ◆ RE-USE EXISTING RAIL WHEN POSSIBLE



## CONCLUSIONS

OBSERVATIONS IN AREAS WHERE HITS OCCURRED, COMBINED WITH AVAILABLE POLICE REPORTS AND OTHER INFORMATION, INDICATED THAT GUARDRAIL RESET USING THE RAISED OFFSET BLOCK METHOD PROVIDED THE SAME PROTECTION AS THE STANDARD METHOD. THERE WERE NO INDICATIONS THAT THE GUARDRAIL DID NOT PERFORM AS EXPECTED AND NO ANOMALIES WERE DETECTED.

## SAVINGS FROM RESET GUARDRAIL

BETWEEN JANUARY 2009 AND JUNE 2013,  
27 PROJECTS RESULTED IN:  
\$ 4,757,516.25 SAVINGS FROM RESET VS. NEW RAIL  
\$ 519,615.25 SAVINGS FROM RE-USING POSTS  
**\$ 5,277,131.50 TOTAL SAVINGS**

## OBSERVATIONS

MANY OF THE OBSERVED HITS SHOWED LITTLE OBVIOUS LOSS OF STABILITY EVEN THOUGH THE DAMAGE APPEARED TO BE SIGNIFICANT.



IN OTHER LOCATIONS, WOODEN POST FAILURE WAS OBSERVED BUT THE STEEL RAIL REMAINED INTACT AND APPEARED TO HAVE PROVIDED ADEQUATE PROTECTION.



A STATE OF NH TRAFFIC ACCIDENT REPORT OBTAINED FOR ONE HIT INDICATED THAT THE RAISED GUARDRAIL PROVIDED THE PROTECTION REQUIRED TO PREVENT OVERTURNING AND SERIOUS INJURY.



THIS WAS A ONE-VEHICLE ACCIDENT THAT OCCURRED DURING SLIPPERY CONDITIONS. A 1995 FORD F150 PICK-UP TRUCK WAS TRAVELING BETWEEN 60 AND 65 MPH IN THE HIGH SPEED LANE ALONG SIDE ANOTHER VEHICLE. THE DRIVER LOST CONTROL AND STRUCK THE GUARDRAIL; HOWEVER, NO CONTACT WAS MADE WITH THE OTHER VEHICLE. WHEN THE TRUCK CAME TO A STOP IT DID NOT OVERTURN AND ONLY MINOR INJURIES WERE REPORTED.

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